

REMARKS

Objections to Drawings/Specification

The Examiner has objected to the drawings. Specifically, the Examiner states that the limitation where single conductive disk is electrically coupled to a plurality of terminals is not shown.

Similarly, the Examiner has objected to the specification as failing to provide proper antecedent basis for this limitation.

Applicant has amended the claims to recite that a respective terminal and not a plurality of terminals are coupled to a given conductive disk. Accordingly, Applicant requests the Examiner to withdraw the objections to the drawings and the specification.

Objections to Claims

The examiner has objected to claims 4, 11, and 17 due to various informalities. In reference to claims 4 and 11, "the outer perimeter" lacks antecedent basis. In claim 8, a grammatical error appears on line 2. In claim 17, the phrases "operable coupling" and "operable couples" are asserted to be grammatically awkward.

In regard to claims 4 and 11, claim 4 is cancelled and "the outer perimeter" in claim 11 has been changed to --an outer perimeter--. In regard to claim 8, the grammatical error in line 2 has been corrected. In regard to claim 17, "operable" before "coupling" and "couples" has been deleted.

Applicant requests the Examiner to withdraw the objections to the claims.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 1-23 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The rejection states that the specification does not disclose how a single conductive disk is arranged to make contact with a plurality of terminals within a lead.

As discussed above, the claims have been amended to recite that a respective terminal and not a plurality of terminals are coupled to a given conductive disk.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 1-7 and 21-23 are rejected under 35 U.S.C. § 112, second paragraph. These claims are cancelled to allow Applicant to introduce new claims without paying additional claim fees. Accordingly, the rejection of claims 1-7 and 21-23 is not addressed herein.

Rejections under 35 U.S.C. §§ 102(b), 103(a)

Claims 1-6, 14-19, 21 and 22 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,730,628 (hereinafter referred to as “Hawkins”).

Claims 7-13, 20 and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,730,628 (hereinafter referred to as “Hawkins”).

Independent claims 8 and 14 have been amended and new claims 24-34 have been added. Some of the amendments have been made for the purpose of grammatical clarity. The amendments and new claims are supported by the original application. No new matter has been entered. Also, as previously stated, claims 1-7 and 21-23 have been cancelled.

Due to the amendments, the rejections in the current office action are moot and, hence, are not addressed herein.

The Amended Claims and New Claims Are Patentable over Hawkins

As amended, claim 8 recites:

an implantable pulse generator coupled to the at least one stimulation lead, wherein the implantable pulse generator is operable to deliver electrical energy to the at least one stimulation lead in response to at least one control signal, and wherein an electrical contact electrically couples the at least one implantable stimulation lead to the implantable pulse generator, the electrical contact comprising:

a conductive disk, wherein the conductive disk is operably coupled to the implantable pulse generator; and

a plurality of conductive projections extending inwardly from a perimeter of the disk, wherein the plurality of conductive projections are generally planar relative to an orientation of the conductive disk, wherein the conductive projections flex to

receive the at least one implantable stimulation lead and electrically couple to a respective terminal of a plurality of terminals of the at least one implantable stimulation lead.

As amended, claim 14 recites:

coupling a conductive disk to the tissue stimulation device, wherein the conductive disk possesses a perimeter and a plurality of conductive projections that are disposed in a generally planar manner relative to an orientation of the conductive disk and that extend inwardly from the perimeter of the conductive disk; and receiving the implantable lead with the plurality of conductive projections, wherein the conductive projections flex and electrically couple to a plurality of terminals of the implantable lead.

Claim 24 recites:

a header for receiving a stimulation lead, the header comprising a respective conductive disk for each terminal of the stimulation lead for coupling a respective electrode of the stimulation lead to the circuitry for generating electrical pulses, wherein each conductive disk possesses a perimeter and a plurality of flexible projection elements that are disposed in a generally planar manner relative to an orientation of the respective conductive disk and that extend inward from the perimeter;

wherein upon insertion of the stimulation lead into the header, the flexible projection elements flex and apply a force against the stimulation lead to hold terminals of the stimulation lead against the conductive disks.

Claim 30 recites:

a header for receiving a stimulation lead, the header comprising a plurality of electrical contacts for coupling with respective terminals of a stimulation lead, wherein each of the plurality of electrical contacts comprises:

a cylindrical band structure for electrically coupling with the circuitry for generating via a feed-through conductor; and

a conductive disk that comprises (i) a first plurality of flexible projection elements that are disposed in a generally planar manner relative to an orientation of the respective conductive disk and that extend inward from a perimeter of the conductive disk and (ii) a second plurality of projection elements that generally extend in a perpendicular direction from the conductive disk that electrically and mechanically couple to conductive disk to the cylindrical band structure;

wherein upon insertion of the stimulation lead into the header, the flexible projection elements flex and apply a force against the stimulation lead to hold terminals of the stimulation lead against the conductive disks.

Hawkins is directed to a multi-contact connector for an implantable medical device and, more specifically, for a pacemaker. The connector assembly is shown in FIGS. 3-5 of Hawkins and includes "spring elements 64." As seen in the FIGS., the spring elements

extend longitudinally along the connector. Also, the spring elements possess a curved shape. The curved shape causes the spring elements to come into contact with a terminal of a pacing lead when the lead is inserted within the connector. The spring elements are described as “providing effortless, positive and secure mechanical and electrical connection of an electrical lead” and “providing an effortless, simple and reliable disconnection of an electrical lead.” Hawkins, col. 3, lines 19-26.

Although the Hawkins electrical connection provides advantageous connection and disconnection of an electrical lead when compared to more conventional connector designs, Hawkins does not teach or suggest the subject matter of claims 8, 14, 24, and 30. Specifically, Hawkins does not teach or suggest flexible projection elements that are generally co-planar with a conductive disk and that extend inward. In fact, the spring elements of Hawkins extend longitudinally and are not “co-planar” with a conductive disk. Thus, the claimed subject matter enables a greater number of connectors to be placed within a header of an implantable pulse generator. Accordingly, the implantable pulse generator can accommodate a greater number of independent terminals (and, hence, independent electrodes) without causing an implantable pulse generator to possess a cumbersome size for implantation within a patient. The ability to accommodate a larger number of electrodes is especially important in neurostimulation (e.g., spinal cord stimulation) in which variations in the use of specific electrodes to apply current to neural tissue can have a significant impact on effectiveness of the neurostimulation therapy.

Also, in specific regard to claim 30, Hawkins does not teach or suggest “a second plurality of projection elements that generally extend in a perpendicular direction from the conductive disk that electrically and mechanically couple to conductive disk to the cylindrical band structure.”

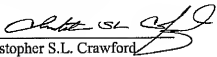
Independent claims 8, 14, 24, and 30 are patentable over Hawkins. Claims 9-13, 15-20, 25-29, and 31-34 respectively depend from claims 8, 14, 24, and 30 and, hence, are also patentable over Hawkins.

Conclusion

Applicant respectfully submits that the application is in condition for allowance and requests the Examiner to pass the application to issue.

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Respectfully submitted,

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